

IN THE UNITED STATES DISTRICT COURT  
FOR THE EASTERN DISTRICT OF TEXAS  
MARSHALL DIVISION

AR DESIGN INNOVATIONS LLC,

Plaintiff,

v.

IKEA NORTH AMERICA SERVICES LLC  
and IKEA DALLAS L.P.,

Defendants.

CIVIL ACTION NO. 2:21-cv-00465

**JURY TRIAL DEMANDED**

**COMPLAINT FOR PATENT INFRINGEMENT**

Plaintiff AR Design Innovations LLC (“AR Design” or “Plaintiff”) files this complaint against Defendants IKEA North America Services LLC and, IKEA Dallas L.P. (collectively “Defendants”) alleging, based on its own knowledge as to itself and its own actions, and based on information and belief as to all other matters, as follows:

**PARTIES**

1. AR Design Innovations LLC is a limited liability company organized under the laws of the State of Texas, with its principal place of business at 815 Brazos Street, Suite 500, Austin, Texas 78701-2509 (Travis County).

2. IKEA North America Services LLC (“IKEA NAS”) is a limited liability company organized under the laws of the Commonwealth of Virginia with its corporate headquarters located at 420 Alan Wood Road, Conshohocken, Pennsylvania, 19428.

3. IKEA Dallas L.P. (“IKEA Dallas”) is a limited partnership organized under the laws of Delaware with its primary place of business located at 7171 IKEA Drive, Frisco, Texas, 75034-8591.

4. Defendants may both be served through their registered agent for service, CT Corporation System, which is located at 1999 Bryan St., Suite 900, Dallas, Texas 75201.

### **JURISDICTION AND VENUE**

5. AR Design repeats and re-alleges the allegations in Paragraphs 1-4 as though fully set forth in their entirety.

6. This is an action for infringement of a United States patent arising under 35 U.S.C. §§ 271, 281, and 284–285, among others. This Court has subject matter jurisdiction of the action under 28 U.S.C. § 1331 and § 1338(a).

7. Venue is proper in this district pursuant to 28 U.S.C. §§ 1400(b) and 1391(c).

8. Each Defendant is subject to this Court's specific and general personal jurisdiction due at least to Defendants' substantial business in this forum, including (i) at least a portion of the infringements alleged herein; or (ii) regularly doing or soliciting business, engaging in other persistent courses of conduct, or deriving substantial revenue from goods and services provided to individuals in Texas and in this district.

9. Specifically, each Defendant intends to and does business in Texas, directly or through intermediaries, and offers products or services, including those accused herein of infringement, to customers and potential customers located in Texas, including in this District.

10. Upon information and belief based upon public information, IKEA NAS maintains regular and established places of business in this District, *e.g.*, 7171 IKEA Drive, Frisco, Texas, 75034-8591.

11. Upon information and belief based upon public information, IKEA Dallas maintains regular and established places of business in this District, *e.g.*, 7171 IKEA Drive, Frisco, Texas, 75034-8591.

## THE TECHNOLOGY

### The Invention

12. AR Design repeats and re-alleges the allegations in Paragraphs 1-11 as though fully set forth in their entirety.

13. Cathryn MacInnes and Gerald Pearlstein are the inventors of U.S. Patent No. 7,277,572 (the “’572 patent”). A true and correct copy of the ’572 patent is attached as **Exhibit A**.

14. The ’572 patent resulted from the pioneering efforts of Ms. MacInnes and Mr. Pearlstein (hereinafter “the Inventors”) in the area of interactive, three-dimensional (3D) interior design systems. These efforts resulted in the development of a method and apparatus for generating and rendering a photorealistic 3D perspective view of a 3D object (*e.g.*, a piece of furniture) that can be selectively positioned and manipulated within a 3D scene, such as a living room in a person’s house, in the early 2000s. At the time of these pioneering efforts, the most widely implemented technology used to try to address the need for a real-time, network-based interactive system for use in visualizing furniture in a room prior to placing an order for that furniture was either limited by its capability of using only two-dimensional (2D) images of the furniture or, if it had such 3D capability, the 3D furniture could not be rendered for manipulation within a 3D representation of the room into which the furniture was to be placed.

15. Other systems at that time allowed users to import photographs of actual rooms into the program, and then place 3D furniture objects into the room, which could be rotated to fit the scene. However, the room images for such systems were not associated with a 3D model of the room and lacked the capability of rendering furniture objects placed onto floor plans in photographically derived scenes, and/or did not provide for the manipulation of 3D furniture objects at the client computer.

16. The Inventors conceived of the inventions claimed in the '572 patent as a way to provide an improved 3D design and visualization system that includes an easy to use Graphical User Interface ("GUI"), which is capable of enabling a user to quickly and conveniently generate or import 3D scenes from a server, import and manipulate 3D objects (like furniture) in the scenes in real-time, and render them in photorealistic detail on a client computer.

17. For example, the Inventors developed a method in a client-server computing environment for generating and rendering a photorealistic 3D perspective view of a 3D object selectively positioned within a 3D scene. The method includes operating a client application with a GUI and displaying a 3D scene with the GUI. It also includes configuring the 3D scene for being selectively displayed in a plurality of views; retrieving at least one 3D object (*e.g.*, furniture) from a server; importing the 3D object into the 3D scene to generate a composite; and manipulating the 3D object within the composite for placement and orientation. A 3D image of the composite may be rendered at the client and selectively reconfigured in real-time. Luminosity characteristics may be applied to the 3D image and a photorealistic 3D view of the composite image may be rendered with the client application, including the luminosity characteristics.

#### **Advantage Over the Prior Art**

18. The invention disclosed in the '572 patent provides many advantages over the prior art, and in particular improved systems for depicting a realistic 3D rendering of a space with architectural and design elements therein capable of real-time, user-friendly manipulation by a client. The system may be used by interior designers and architects (or by their clients) to easily design interior spaces with the help of an intuitive and easy to use custom interface. The resulting design may then be displayed on any number of suitable displays, such as phones, tablets, or

computers, to improve customer visualization of proposed designs. *See* '572 patent at 6:53-67.<sup>1</sup> One advantage of the patented invention is the easy-to-use GUI that is capable of enabling a user to quickly and conveniently generate or import 3D scenes, import and manipulate at the client computer 3D objects in the scenes in real-time, and which is capable of rendering them in photorealistic detail on the client computer. *See* '572 patent at 4:18-25.

19. Another advantage of the patented invention is that it provides the ability to represent changes in both natural and artificial light, which may be precise enough to depict lighting and shadow associated with a particular exposure during a particular season at a predetermined hour of the day at a particular geographic location worldwide. Advantageously, this ability enables the aesthetics of the conceptualized design to be accurately communicated prior to build-out of the actual room(s). *See* '572 patent at 7:12-17.

20. Because of these significant advantages that can be achieved by the patented invention, the '572 patent presents significant commercial value for companies like Defendants. Indeed, use of the patented method has become widespread among members of the public interested in buying furniture products, including customers of Defendants. It has become quite popular and advantageous as part of the furniture buying process for a customer to first utilize the patented invention offered by Defendants and other furniture sellers, to import 3D objects (like furniture) from the seller's server and render them in photorealistic detail, including with luminosity effects, within a room setting on the client computer.

### **Technological Innovation**

21. The disclosures and claims of the '572 patent resolve technical problems related to computerized three-dimensional modeling systems, particularly problems related to the utilization

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<sup>1</sup> As used herein, a citation in the form such as "6:53-67" refers to column 6, lines 53-67 of the patent.

of technology for rendering and manipulating in real-time 3D furniture objects on a client computer with a user-selected or user-generated interior design scene, as well as editing of those objects to apply lighting and shadow effects called luminosity effects. As the '572 patent explains, one of the limitations of the prior art as regards such prior art modeling systems was that many of them generated furniture images in 2D as opposed to 3D, which did not enable them to be shown in context of a background scene, *e.g.*, a particular room, and did not enable them to be manipulated, *e.g.*, for scaling, rotation and particular placement within the background scenes. Some prior art systems did include 3D furniture models, which can be rotated and scaled to fit the scene. However, for example, the room images for such systems were not associated with a 3D model of the room and lacked the capability of rendering furniture objects placed onto floor plans in photographically derived scenes, and/or did not provide for the manipulation of 3D furniture objects at the client computer. *See* '572 patent at 2:6-64, 3:12-29 and 3:58-4:17.

22. Moreover, the disclosures and claims of the '572 patent recite inventive concepts that are not merely routine or conventional use of computerized 3D modeling systems and, more particularly, to a software application configured to reside on a client computer that is capable of manipulating 3D object representations *in-situ* with a user-selected or user-generated interior design scene and rendering quality perspective images of the composite scene. Instead, the claims of the '572 patent are directed to a new and novel solution to specific problems related to improving a software application configured to reside on a client computer, which is capable of manipulating 3D object representations at the client computer with a user-selected or user-generated interior design scene, including selectively reconfiguring a given 3D object in real time and applying luminosity characteristics to the 3D image, thereby rendering quality perspective images of the composite scene.

23. The claims of the '572 patent do not preempt all the ways that a method in a client-server computing environment for generating and rendering a photorealistic 3D perspective view of a 3D object selectively positioned within a 3D scene may be used to improve computerized 3D modeling systems, nor does the '572 patent preempt any other well-known or prior art technology.

24. Accordingly, the claims in the '572 patent recite a combination of elements sufficient to ensure that the claims in substance and in practice amount to significantly more than a patent-ineligible abstract idea.

### **THE ACCUSED INSTRUMENTALITIES**

25. AR Design repeats and re-alleges the allegations in Paragraphs 1-24 as though fully set forth in their entirety.

26. Defendants make, have made, use, cause to be used, import, provide, supply, distribute, or offer one or more augmented reality products and tools, including but not limited to, the Ikea Place App, which is offered at least through Defendants' downloadable iOS and Android mobile shopping apps ("the Accused Instrumentalities"). *See Exhibit B.*

27. The Accused Instrumentalities are downloadable to a user's phone, tablet, or computer including but not limited to, phones, tablets, or computers used by employees of Defendants and their customers.

### **COUNT I: DIRECT INFRINGEMENT OF U.S. PATENT NO. 7,277,572**

28. AR Design repeats and re-alleges the allegations in Paragraphs 1-27 as though fully set forth in their entirety.

29. The United States Patent and Trademark Office duly issued the '572 patent on October 2, 2007 after full and fair examination. *See Ex. A at A-1.* A Certificate of Correction was issued on May 18, 2010. *See id. at A-51.*

30. The '572 patent is entitled "Three-Dimensional Interior Design System."

31. AR Design owns all substantial rights, interest, and title in and to the '572 patent, including the sole and exclusive right to prosecute this action and enforce the '572 patent against infringers, and to collect damages for all relevant times.

32. The claims of the '572 patent are not directed to an abstract idea. For example, claim 1 of the '572 patent recites a specific and multi-step method to generate and render a photorealistic 3D perspective view of a 3D object selectively positioned within a 3D scene. The method enables a user to connect to a server, interact with a graphical user interface ("GUI"), and retrieve and manipulate a 3D image – including applying different luminosity characterizations – that result in a photorealistic 3D view of the composite image, including any luminosity characteristics. Taken as a whole, the claimed inventions of the '572 patent are not limited to well-understood, routine, or conventional activity. Rather, the claimed inventions include inventive components that improve upon the experience of furnishing an interior space.

33. The written description of the '572 patent describes in technical detail each of the limitations of the claims, allowing a skilled artisan to understand the scope of the claims and how the non-conventional and non-generic combination of claim limitations is patently distinct from and improved upon what may have been considered conventional or generic in the art at the time of the invention.

34. Each Defendant has infringed the '572 patent by making, having made, using, importing, providing, supplying, distributing, selling, or offering the Accused Instrumentalities to customers.

35. The Accused Instrumentalities include mobile applications that perform a method in a client-server computing environment for generating and rendering a photorealistic 3D perspective view of a 3D object selectively positioned within a 3D scene.

36. The Accused Instrumentalities perform and supply a method in a client-server computing environment for generating and rendering a photorealistic 3D perspective view of a 3D object selectively positioned within a 3D scene.

37. Each Defendant has directly infringed, either literally or under the doctrine of equivalents, at least claim 1 of the '572 patent.

38. The method performed and supplied by the Accused Instrumentalities includes the steps of communicably accessing a server with a client; operating with the client, a client application configured for scene editing and rendering, including a GUI; displaying a 3D scene with the GUI; configuring the 3D scene for being selectively displayed in a plurality of views; retrieving at least one 3D object from the server; importing the 3D object into the 3D scene to generate a composite; manipulating the 3D object within the composite for placement and orientation; rendering a 3D image of the composite at the client; selectively reconfiguring the 3D image in real time; applying luminosity characteristics to the 3D image; and rendering, with the client application, a photorealistic 3D view of the composite image, including the luminosity characteristics. Each Defendant's infringement in this regard is ongoing.

39. Plaintiff has been damaged as a result of the infringing conduct by Defendants alleged above. Each Defendant is liable to Plaintiff in an amount that compensates it for such infringements, which by law cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

40. Plaintiff or its predecessors-in-interest have satisfied all statutory obligations required to collect pre-filing damages for the full period allowed by law for infringement of the '572 patent.

41. Since at least the time of receiving this Complaint, each Defendant has also indirectly infringed the '572 patent by inducing others to directly infringe the '572 patent. Each Defendant has induced end-users, including Defendants' customers, to directly infringe, either literally or under the doctrine of equivalents, the '572 patent by downloading and using the Accused Instrumentalities. Each Defendant took active steps, directly or through contractual relationships with others, with the specific intent to cause them to use the Accused Instrumentalities in a manner that infringes one or more claims of the '572 patent, including, for example, claim 1 of the '572 patent. Such steps by each Defendant included, among other things, advising or directing personnel, contractors, or end-users to make or use the Accused Instrumentalities in an infringing manner; advertising and promoting the use of the Accused Instrumentalities in an infringing manner; or distributing instructions that guide users to use the Accused Instrumentalities in an infringing manner. Each Defendant is performing these steps, which constitutes induced infringement with the knowledge of the '572 patent and with the knowledge that the induced acts constitute infringement. Each Defendant is aware that the normal and customary use of the Accused Instrumentalities by others would infringe the '572 patent. Defendants' inducement is ongoing.

42. Each Defendant has also indirectly infringed by contributing to the infringement of the '572 patent. Each Defendant has contributed to the direct infringement of the '572 patent by its personnel, contractors, and customers. The Accused Instrumentalities have special features that are specially designed to be used in an infringing way and that have no substantial uses other than ones that infringe one or more claims of the '572 patent, including, for example, claim 1 of the

'572 patent. The special features include, for example, the method recited in claim 1, including all the intermediary steps, that allow the claimed method to generate and render a photorealistic 3D perspective view of a 3D object selectively positioned within a 3D scene. The special features constitute a material part of the invention of one or more of the claims of the '572 patent and are not staple articles of commerce suitable for substantial non-infringing use. Defendants' contributory infringement is ongoing.

43. Each Defendant has had knowledge of the '572 patent at least as of the date when it was notified of the filing of this action.

44. Furthermore, on information and belief, each Defendant has a policy or practice of not reviewing the patents of others (including instructing its employees to not review the patents of others), and thus has been willfully blind of Plaintiff's patent rights.

45. Each Defendant's actions are at least objectively reckless as to the risk of infringing a valid patent and this objective risk was either known or should have been known by each Defendant.

46. Each Defendant's direct and indirect infringement of the '572 patent is, has been, and continues to be willful, intentional, deliberate, or in conscious disregard of Plaintiff's rights under the patent.

47. Plaintiff has been damaged as a result of the infringing conduct by each Defendant alleged above. Thus, each Defendant is liable to AR Design in an amount that compensates it for such infringements, which by law cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

48. AR Design has suffered irreparable harm, through its loss of market share and goodwill, for which there is no adequate remedy at law. AR Design has and will continue to suffer this harm

by virtue of each Defendant's infringement of the '572 patent. Each Defendant's actions have interfered with and will interfere with AR Design's ability to license technology. The balance of hardships favors AR Design's ability to commercialize its own ideas and technology. The public interest in allowing AR Design to enforce its right to exclude outweighs other public interests, which supports injunctive relief in this case.

**JURY DEMAND**

49. Plaintiff hereby requests a trial by jury on all issues so triable by right.

**PRAYER FOR RELIEF**

50. WHEREFORE, AR Design Innovations LLC requests that the Court find in its favor and against Defendants, and that the Court grant AR Design the following relief:

- a. Judgment that one or more claims of the Asserted Patent has been infringed, either literally or under the doctrine of equivalents, by Defendants or all others acting in concert therewith;
- b. A permanent injunction enjoining Defendants and their officers, directors, agents, servants, affiliates, employees, divisions, branches, subsidiaries, parents, and all others acting in concert therewith from infringement of the '572 patent; or, in the alternative, an award of a reasonable ongoing royalty for future infringement of the Asserted Patent by such entities;
- c. Judgment that Defendants account for and pay to AR Design all damages to and costs incurred by AR Design because of Defendants' infringing activities and other conduct complained of herein;
- d. Judgment that Defendants' infringements be found willful, and that the Court award treble damages for the period of such willful infringement pursuant to 35 U.S.C. § 284;

- e. Pre-judgment and post-judgment interest on the damages caused by Defendants' infringing activities and other conduct complained of herein;
- f. That this Court declare this an exceptional case and award AR Design its reasonable attorneys' fees and costs in accordance with 35 U.S.C. § 285; and
- g. All other and further relief as the Court may deem just and proper under the circumstances.

Dated: December 23, 2021

Respectfully submitted,

By: /s/ Jonathan L. Hardt

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\*Admitted to the Eastern District of Texas

**List Of Exhibits**

- A. U.S. Patent No. 7,277,572
- B. Website: Ikea Place App